UNIVERSITY OF EMBU

STAFF WEBSITE PROFILE

Name: Dominic Makaa Kitavi

Title/Qualification: Dr. / PhD

Position: Lecturer

Department: MCIT

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Area of Specialization: Applied Mathematics

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Short Biography

D. M. Kitavi obtained the B.Sc. (first-class honors) in Mathematics in 2011 from the University of Nairobi (Kenya), M.Sc. (cum laude) in Mathematical Sciences in 2013 from University of the Western Cape (South Africa), and PhD in Statistical Signal Processing in 2017 from the Hong Kong Polytechnic University (Hong Kong).

D. M. Kitavi joined University of Embu as a lecturer in September 2017.

Research Interests

Partial Differential Equations and Statistical Signal Processing.

Publications in Journals:

1. C. G. Ngari & **D. M. Kitavi**, "Parameterization and Forecasting of Childhood Pneumonia Model Using Least Square Approximation, Lagrange Polynomial and Monte Carlo Simulation," *Journal of the Annual Research and Review in Biology*, vol. 35, no. 8, pp. 102 – 114, August 2020. https://www.journalarrb.com/index.php/ARRB/article/view/30265
2. **D. M. Kitavi**, K. T. Wong, T.-C. Lin, & Y. I. Wu, "Hybrid Cramer-Rao Bound of Direction Finding Using a Triad of Cardioid Sensors That are Perpendicularly Oriented and Spatially Collocated," *Journal of Acoustical Society of America*, vol. 146, no. 2, pp. 1099 – 1109, August 2019. https://asa.scitation.org/doi/10.1121/1.5120521
3. K. T. Wong, Z. N. Morris, **D. M. Kitavi**, & T.-C. Lin, "A Uniform Circular Array of Isotropic Sensors that Stochastically Dislocate in Three Dimensions – The Hybrid Cramer-Rao Bound of Direction-of-Arrival Estimation," *Journal of Acoustical Society of America*, vol. 146, no. 1, pp. 150 – 163, July 2019. https://asa.scitation.org/doi/10.1121/1.5098771
4. V. Nyokabi, **D. M. Kitavi**, & C. G. Ngari, "Cramer-Rao Bound of Direction Finding Using Uniform Arc Arrays," *Journal of Advances in Mathematics and Computer Science*, vol. 33, no. 1, pp. 1 – 15, July 2019. http://www.journaljamcs.com/index.php/JAMCS/article/view/30168
5. G. W. Ndiritu, **D. M. Kitavi**, & C. G. Ngari, "Cramer-Rao Bound of Direction Finding Using a Uniform Hexagonal Array," *Journal of Advances in Mathematics and Computer Science*, vol. 32, no. 6, pp. 1 – 14, June 2019. http://www.journaljamcs.com/index.php/JAMCS/article/view/30161
6. M. Kinyili, **D. M. Kitavi**, & C. G. Ngari, "Aperture Maximization with Half-Wavelength Spacing, via a 2-Circle Concentric Array Geometry that is Uniform but Sparse," *Journal of Advances in Mathematics and Computer Science*, vol. 32, no. 3, pp. 1 – 20, May 2019. http://www.journaljamcs.com/index.php/JAMCS/article/view/30148
7. **D. M. Kitavi**, K. T. Wong & C.-C. S. Hung, "An L-shaped Array with Non-Orthogonal Axes – Its Cramer-Rao Bound for Direction Finding," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 54, no. 1, pp. 486 – 492, February 2018. http://ieeexplore.ieee.org/document/8012415/

8. **D. M. Kitavi**, K. T. Wong, M. Zou & K. Agrawal, "A Lower Bound of Estimation Error of an Emitter's Direction-of-Arrival / Polarization, for a Collocated Triad of Orthogonal Dipoles/Loops That Fail Randomly," *IET Microwaves, Antennas & Propagation*, vol. 11, no. 7, pp. 961 – 970, June 2017. http://ieeexplore.ieee.org/document/7935594/
9. **D. M. Kitavi,** T.-C Lin, K. T. Wong & Y. I. Wu, "Direction Finding with the Sensors' Gains Suffering Bayesian Uncertainty — Hybrid CRB and MAP Estimation," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 52, no. 4, pp. 2038 – 2044, August 2016.
http://ieeexplore.ieee.org/abstract/document/7738373/

Presentation of Papers at Academic and Professional Conferences

1. **D. M. Kitavi** & K. T. Wong, "A Uniform Rectangular Array of Isotropic Sensors of Stochastic Gains: The Hybrid Cramer-Rao Bound for Direction Finding," *Journal of the Acoustical Society of America*, vol. 146, no. 4, pp. 2867, November 2019.
https://asa.scitation.org/doi/abs/10.1121/1.5136948
2. M. Kinyili & **D. M. Kitavi**, "Precision of 3-Configurations with Respective Sub-Configurations of 2-Ring Concentric Planar Array in Direction finding," *Kirinyaga University 3rd Annual International Conference*, September 2019.
https://www.kyu.ac.ke/phocadownload/Book_of_Abstracts/BOOK%20OF%20ABSTRACTS,%202019.pdf
3. **D. M. Kitavi** & M. Kinyili, "Cramer-Rao Bound of Direction Finding Using Multi-Concentric Circular Arrays," *Proceedings of the* 6th *International Arab Conference on Mathematics and Computations (IACMC)*, pp. 49-55, April 2019, http://iacmc.zu.edu.jo/eng/
4. Z. N. Morris, K. T. Wong, **D. M. Kitavi,** & T.-C. Lin, "The Hybrid Cramer-Rao Bound of Direction Finding by a Uniform Circular Array of Isotropic Sensors that Suffer Stochastic Dislocations," *Journal of the Acoustical Society of America (ASA)*, vol. 142, no. 4, pp. 2554, November 2017. http://asa.scitation.org/doi/10.1121/1.5014336
5. **D. M. Kitavi,** K. T. Wong, L. Yeh & T.-C. Lin, "Cramer-Rao Bound for Direction Finding at a Tri-Axial Velocity-Sensor of an Acoustic Event Having an AR(1) Temporal Auto-Correlation," *Journal of the Acoustical Society of America (ASA)*, vol. 141, no.5, pp. 3650, June 2017. http://asa.scitation.org/doi/abs/10.1121/1.4987895
6. **D. M. Kitavi,** H. Tan & K. T. Wong, "A Regular Tetrahedral Array Whose Constituent Sensors Fail Randomly - A Lower Bound for Direction-of-Arrival Estimation," *2016 IEEE Loughborough Antennas & Propagation Conference (LAPC*), pp. 1 – 5, November 2016.
http://ieeexplore.ieee.org/document/7807600/
7. **D. M. Kitavi,** T.-C. Lin & K. T. Wong, "A Tetrahedral Array of Isotropic Sensors, Each Suffering a Random Complex Gain – The Resulting Hybrid Cramer-Rao Bound for Direction Finding," *2016 IEEE National Aerospace and Electronics Conference (NAECON) and Ohio Innovation Summit (OIS)*, pp. 412 – 415, July 2016. http://ieeexplore.ieee.org/document/7856840/

Review of Academic Journal papers

1. IEEE Transactions on Aerospace and Electronic Systems
2. Journal of Acoustical Society of America
3. Scientific African Journal – Elsevier

Supervision of Student/On going research

1. ***Veronicah Nyokabi*** - *Master of Science in Applied Mathematics.*
   Thesis title: Cramer-Rao bound of Direction Finding Using Uniform Arc Arrays
   Graduation: September 2019, ***University of Embu***.
2. ***Musyoka Kinyili*** - *Master of Science in Applied Mathematics.*
   Thesis title: Cramer-Rao bound of Direction Finding Using 2-Circle Concentric Uniform Array
   Graduation: September 2019, ***University of Embu***.
3. ***Grace Ndiritu*** - *Master of Science in Applied Mathematics*
   Thesis title: Cramer-Rao bound of Direction Finding Using Uniform Hexagonal Array
   Graduation: September 2019, ***University of Embu***.

Grant Awarded